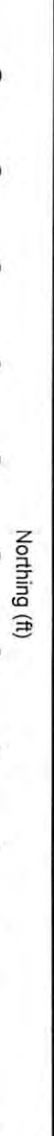
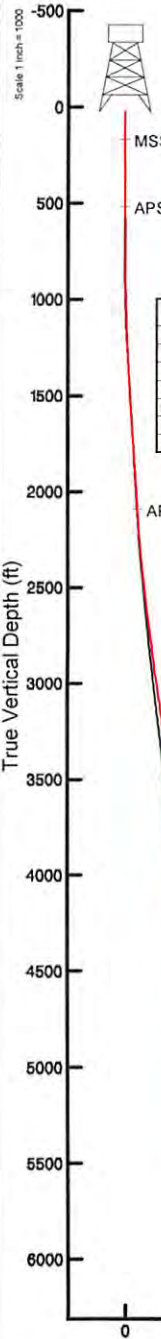
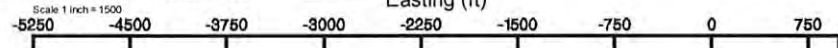


Location: Brooke County, WV
Field: Brooke
Facility: Russell Hervey BRK Pad

Slot: Slot #01
Well: Russell Hervey BRK 1H
Wellbore: Russell Hervey BRK 1H PWB

Plot reference wellpath is Russell Hervey BRK 1H PWP Rev-B.0	Grid System: NAD83 / UTM Zone 17 North, US feet
True vertical depths are referenced to SDC 46 (RKB)	* = Wellpath was transformed from a different geoid datum
Measured depths are referenced to SDC 46 (RKB)	North Reference: Grid north
SDC 46 (RKB) to Mean Sea Level: 1191 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: Slot #01): -1165 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: edsanyar on 2016-10-05
	Database: WA_MPL_EASTERNUS_Data



MSS <17-1/2"> (170'-356') : 0.40° Inc, 170.00ft MD, 170.00ft TVD, 0.49ft VS

APS EM <12-1/4"> (356')(518'-1965') : 1.25° Inc, 518.00ft MD, 517.99ft TVD, 1.25ft VS

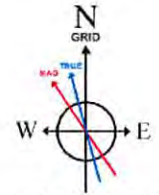
Location Information				
Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Russell Hervey BRK Pad	1764114.320	14621028.950	40°15'29.154"N	80°33'23.868"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)
Slot #01	23.87	-5.70	1764108.620	14621052.810
			40°15'29.391"N	80°33'23.940"W
SDC 46 (RKB) to Mud line (At Slot: Slot #01)				26ft
Mean Sea Level to Mud line (At Slot: Slot #01)				-1165ft
SDC 46 (RKB) to Mean Sea Level				1191ft

APS EM <8-3/4"> (1965')(2096'-5347') : 6.22° Inc, 2096.00ft MD, 2091.83ft TVD, 67.29ft VS

API: 47-009-00178-0000
BHI Job #: 8154316
Rig: SDC 46
Duration: 9/29/2016-10/2/2016

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Well Profile Data								
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (*/100ft)	VS (ft)
Tie On	356.00	0.000	256.410	356.00	0.64	-0.40	0.11	0.75
End of Tangent	800.00	0.000	285.000	800.00	0.64	-0.40	0.00	0.75
End of Build	1300.00	5.000	285.000	1299.36	6.28	-21.46	1.00	16.19
KOP 1	2170.00	5.000	285.000	2166.05	25.91	-94.70	0.00	69.88
End of 3D Arc	2831.95	17.680	261.538	2814.01	18.55	-222.56	2.00	127.60
Curve KOP	5456.09	17.680	261.538	5314.19	-98.72	-1010.84	0.00	421.21
Landing Pt	6419.27	90.632	338.536	5880.00	433.55	-1411.16	9.00	1082.44
BHL	13122.81	90.632	338.536	5806.00	6671.92	-3863.95	0.00	7710.03



User specified Dip: 67.85° Field: 52786 nT
Magnetic North is 8.44 degrees West of True North (at 9/21/2016)
Grid North is 0.29 degrees East of True North
To correct azimuth from True to Grid subtract 0.29 degrees
To correct azimuth from Magnetic to Grid subtract 8.73 degrees

BHI AT Curve <8-1/2"> (5347')(5420'-13099') : 16.54° Inc, 5420.00ft MD, 5283.33ft TVD, 424.71ft VS

BHI AT Curve <8-1/2"> (5347')(5420'-13099') : 5283.33ft TVD, 85.34ft S, 994.70ft W
APS EM <8-3/4"> (1965')(2096'-5347') : 2091.83ft TVD, 18.50ft N, 102.31ft W
APS EM <12-1/4"> (356')(518'-1965') : 517.99ft TVD, 0.22ft N, 2.12ft W
MSS <17-1/2"> (170'-356') : 170.00ft TVD, 0.37ft N, 0.34ft W

Projected MD at TD: 13124' : 90.03° Inc, 13124.00ft MD, 5818.13ft TVD, 7705.98ft VS

Vertical Section (ft)
Azimuth 329.92° with reference 0.00 N, 0.00 E

REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot #01
Area	Brooke County, WV	Well	Russell Hervey BRK 1H
Field	Brooke	Wellbore	Russell Hervey BRK 1H AWB
Facility	Russell Hervey BRK Pad		

REPORT SETUP INFORMATION			
Projection System	NAD83 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.0
North Reference	Grid	User	Edsaryar
Scale	0.999618	Report Generated	10/5/2016 at 5:13:11 PM
Convergence at slot	0.29° East	Database/Source file	WA_MPL_EASTERNUS_Defn/Russell_Hervey_BRK_1H_AWP_Proj__13124_.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	23.87	-5.70	1764108.62	14621052.81	40°15'29.391"N	80°33'23.940"W
Facility Reference Pt			1764114.32	14621028.95	40°15'29.154"N	80°33'23.868"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.478"W

WELLPATH DATUM			
Calculation method	Minimum curvature	SDC 46 (RKB) to Facility Vertical Datum	1191.00ft
Horizontal Reference Pt	Slot	SDC 46 (RKB) to Mean Sea Level	1191.00ft
Vertical Reference Pt	SDC 46 (RKB)	SDC 46 (RKB) to Mud Line at Slot (Slot #01)	26.00ft
MD Reference Pt	SDC 46 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	329.92°

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Actual Wellpath Report

Russell Hervey BRK 1H AWP Proj: 13124'
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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #01
Area	Brooke County, WV	Well	Russell Hervey BRK 1H
Field	Brooke	Wellbore	Russell Hervey BRK 1H AWP
Facility	Russell Hervey BRK Pad		

WELLPATH DATA (155 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
0.00†	0.000	317.590	0.00	0.00	0.00	0.00	1764108.62	14621052.81	40°15'29.391"N	80°33'23.940"W	0.00	0.000	0.00	0.00	0.00
26.00	0.000	317.590	26.00	0.00	0.00	0.00	1764108.62	14621052.81	40°15'29.391"N	80°33'23.940"W	0.00	0.000	0.00	0.00	0.00
170.00	0.400	317.590	170.00	0.49	0.37	-0.34	1764108.28	14621053.18	40°15'29.394"N	80°33'23.944"W	0.50	317.590	0.28	0.28	-29.45
263.00	0.100	80.090	263.00	0.78	0.62	-0.48	1764108.14	14621053.43	40°15'29.397"N	80°33'23.946"W	0.79	322.582	0.50	-0.32	131.72
356.00	0.000	216.990	356.00	0.75	0.64	-0.40	1764108.22	14621053.45	40°15'29.397"N	80°33'23.945"W	0.75	328.070	0.11	-0.11	-86.12
518.00	1.250	256.410	517.99	1.25	0.22	-2.12	1764106.51	14621053.03	40°15'29.393"N	80°33'23.967"W	2.13	276.031	0.77	0.77	-63.94
611.00	1.550	256.580	610.96	1.90	-0.31	-4.33	1764104.30	14621052.50	40°15'29.388"N	80°33'23.996"W	4.34	265.943	0.32	0.32	0.18
704.00	1.880	242.510	703.92	2.33	-1.30	-6.90	1764101.72	14621051.51	40°15'29.378"N	80°33'24.029"W	7.02	259.310	0.57	0.35	-15.13
797.00	1.770	251.840	796.87	2.70	-2.45	-9.62	1764099.00	14621050.36	40°15'29.367"N	80°33'24.064"W	9.93	255.686	0.34	-0.12	10.03
889.00	1.630	270.880	888.83	3.66	-2.88	-12.28	1764096.35	14621049.93	40°15'29.363"N	80°33'24.098"W	12.61	256.811	0.63	-0.15	20.70
936.00	1.540	296.530	935.81	4.54	-2.58	-13.51	1764095.11	14621050.23	40°15'29.366"N	80°33'24.114"W	13.76	259.169	1.51	-0.19	54.57
982.00	1.910	296.410	981.79	5.69	-1.97	-14.75	1764093.87	14621050.84	40°15'29.372"N	80°33'24.130"W	14.88	262.401	0.80	0.80	-0.26
1075.00	2.030	293.610	1074.74	8.31	-0.62	-17.65	1764090.98	14621052.19	40°15'29.385"N	80°33'24.168"W	17.66	267.992	0.17	0.13	-3.01
1214.00	3.310	284.790	1213.58	13.13	1.39	-23.78	1764084.84	14621054.20	40°15'29.406"N	80°33'24.247"W	23.83	273.348	0.96	0.92	-6.35
1260.00	3.600	283.150	1259.50	15.05	2.06	-26.47	1764082.16	14621054.87	40°15'29.412"N	80°33'24.281"W	26.55	274.447	0.67	0.63	-3.57
1353.00	4.630	282.720	1352.26	19.60	3.55	-32.98	1764075.65	14621056.36	40°15'29.427"N	80°33'24.365"W	33.17	276.144	1.11	1.11	-0.46
1446.00	5.190	276.130	1444.92	24.64	4.83	-40.82	1764067.81	14621057.63	40°15'29.440"N	80°33'24.466"W	41.11	276.741	0.85	0.60	-7.09
1539.00	5.540	281.720	1537.51	30.11	6.19	-49.40	1764059.24	14621058.99	40°15'29.454"N	80°33'24.577"W	49.79	277.138	0.68	0.38	6.01
1631.00	5.490	284.320	1629.08	36.15	8.18	-58.01	1764050.63	14621060.98	40°15'29.474"N	80°33'24.688"W	58.59	278.023	0.28	-0.05	2.83
1724.00	5.180	288.750	1721.68	42.43	10.63	-66.30	1764042.35	14621063.43	40°15'29.499"N	80°33'24.794"W	67.15	279.106	0.55	-0.33	4.76
1817.00	5.380	287.830	1814.29	48.82	13.31	-74.43	1764034.22	14621066.12	40°15'29.526"N	80°33'24.899"W	75.61	280.140	0.23	0.22	-0.99
1909.00	5.860	284.720	1905.85	55.33	15.83	-83.07	1764025.58	14621068.63	40°15'29.551"N	80°33'25.010"W	84.57	280.786	0.62	0.52	-3.38
1965.00	5.840	279.340	1961.55	59.16	17.01	-88.65	1764020.00	14621069.82	40°15'29.563"N	80°33'25.082"W	90.27	280.864	0.98	-0.04	-9.61
2096.00	6.220	273.250	2091.83	67.29	18.50	-102.31	1764006.35	14621071.30	40°15'29.578"N	80°33'25.258"W	103.97	280.249	0.57	0.29	-4.65
2189.00	6.120	281.380	2184.29	73.34	19.76	-112.20	1763996.46	14621072.56	40°15'29.591"N	80°33'25.386"W	113.93	279.989	0.94	-0.11	8.74
2285.00	6.240	286.010	2279.74	80.48	22.21	-122.23	1763986.43	14621075.01	40°15'29.616"N	80°33'25.515"W	124.24	280.299	0.53	0.13	4.82
2378.00	7.770	280.830	2372.04	88.24	24.79	-133.27	1763975.40	14621077.59	40°15'29.642"N	80°33'25.657"W	135.55	280.536	1.78	1.65	-5.57
2470.00	10.170	275.370	2462.91	97.03	26.72	-147.46	1763961.21	14621079.51	40°15'29.662"N	80°33'25.840"W	149.87	280.269	2.77	2.61	-5.93
2563.00	12.230	270.150	2554.14	106.75	27.51	-165.49	1763943.19	14621080.31	40°15'29.671"N	80°33'26.073"W	167.76	279.438	2.47	2.22	-5.61
2654.00	13.860	268.450	2642.78	116.81	27.24	-186.03	1763922.66	14621080.04	40°15'29.669"N	80°33'26.338"W	188.01	278.331	1.84	1.79	-1.87



Actual Wellpath Report

Russell Hervey BRK 1H AWP Proj: 13124

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot #01
Area	Brooke County, WV	Well	Russell Hervey BRK 1H
Field	Brooke	Wellbore	Russell Hervey BRK 1H AWB
Facility	Russell Hervey BRK Pad		

WELLPATH DATA (155 stations)															
MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Dir	DLS	Build Rate	Turn Rate
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(US ft)	(US ft)	(ft)	(ft)	(ft)	(°)	(ft/100ft)	(ft/100ft)	(ft/100ft)
2747.00	15.380	269.040	2732.77	128.13	26.73	-209.49	1763899.21	14621079.53	40°15'29.665"N	80°33'26.640"W	211.19	277.272	1.64	1.63	0.63
2840.00	15.190	269.290	2822.48	140.11	26.37	-234.01	1763874.70	14621079.17	40°15'29.663"N	80°33'26.957"W	235.49	276.430	0.22	-0.20	0.27
2933.00	16.170	268.920	2912.02	152.36	25.98	-259.14	1763849.58	14621078.78	40°15'29.660"N	80°33'27.281"W	260.44	275.725	1.06	1.05	-0.40
3025.00	18.150	267.180	2999.92	165.14	25.03	-286.26	1763822.47	14621077.83	40°15'29.652"N	80°33'27.631"W	287.36	274.998	2.22	2.15	-1.89
3118.00	18.590	264.510	3088.18	177.94	22.90	-315.49	1763793.25	14621075.70	40°15'29.633"N	80°33'28.008"W	316.32	274.152	1.02	0.47	-2.87
3211.00	17.950	262.970	3176.49	189.72	19.73	-344.47	1763764.29	14621072.53	40°15'29.603"N	80°33'28.382"W	345.03	273.278	0.86	-0.69	-1.66
3304.00	17.060	262.160	3265.19	200.50	16.11	-372.20	1763736.56	14621068.92	40°15'29.568"N	80°33'28.740"W	372.55	272.479	0.99	-0.96	-0.87
3396.00	17.510	259.940	3353.03	210.34	11.86	-399.20	1763709.57	14621064.66	40°15'29.528"N	80°33'29.088"W	399.38	271.701	0.87	0.49	-2.41
3489.00	18.130	260.870	3441.57	220.31	7.12	-427.26	1763681.52	14621059.92	40°15'29.482"N	80°33'29.450"W	427.32	270.954	0.73	0.67	1.00
3582.00	17.260	259.710	3530.17	230.15	2.36	-455.13	1763653.67	14621055.16	40°15'29.436"N	80°33'29.810"W	455.13	270.297	1.01	-0.94	-1.25
3674.00	17.810	260.450	3617.89	239.71	-2.42	-482.43	1763626.38	14621050.39	40°15'29.391"N	80°33'30.163"W	482.44	269.713	0.65	0.60	0.80
3767.00	17.080	260.000	3706.62	249.38	-7.15	-509.90	1763598.91	14621045.66	40°15'29.345"N	80°33'30.517"W	509.95	269.197	0.80	-0.78	-0.48
3860.00	17.120	261.950	3795.51	259.21	-11.44	-536.91	1763571.92	14621041.38	40°15'29.304"N	80°33'30.866"W	537.03	268.780	0.62	0.04	2.10
3952.00	18.210	262.560	3883.17	269.82	-15.19	-564.57	1763544.27	14621037.62	40°15'29.268"N	80°33'31.223"W	564.78	268.458	1.20	1.18	0.66
4045.00	19.400	258.930	3971.20	280.45	-20.04	-594.14	1763514.71	14621032.78	40°15'29.222"N	80°33'31.605"W	594.48	268.068	1.79	1.28	-3.90
4138.00	18.530	256.370	4059.16	289.66	-26.49	-623.66	1763485.20	14621026.33	40°15'29.160"N	80°33'31.986"W	624.22	267.668	1.29	-0.94	-2.75
4231.00	17.420	253.990	4147.62	297.23	-33.81	-651.40	1763457.47	14621019.01	40°15'29.089"N	80°33'32.344"W	652.28	267.029	1.43	-1.19	-2.56
4323.00	15.000	257.630	4235.96	304.20	-40.16	-676.28	1763432.60	14621012.66	40°15'29.027"N	80°33'32.665"W	677.47	266.601	2.85	-2.63	3.96
4416.00	14.130	269.350	4325.99	313.44	-42.87	-699.39	1763409.50	14621009.96	40°15'29.001"N	80°33'32.964"W	700.70	266.492	3.30	-0.94	12.60
4509.00	15.980	274.820	4415.79	326.35	-41.92	-723.50	1763385.40	14621010.90	40°15'29.012"N	80°33'33.274"W	724.71	266.684	2.51	1.99	5.88
4602.00	18.780	272.580	4504.54	341.75	-40.17	-751.21	1763357.69	14621012.65	40°15'29.031"N	80°33'33.632"W	752.29	266.939	3.09	3.01	-2.41
4694.00	19.980	266.690	4591.33	356.83	-40.41	-781.70	1763327.22	14621012.41	40°15'29.030"N	80°33'34.025"W	782.75	267.040	2.49	1.30	-6.40
4787.00	20.460	261.280	4678.61	369.90	-43.80	-813.64	1763295.30	14621009.03	40°15'28.998"N	80°33'34.437"W	814.81	266.919	2.07	0.52	-5.82
4880.00	19.840	254.840	4765.93	379.89	-50.39	-844.94	1763264.01	14621002.44	40°15'28.934"N	80°33'34.841"W	846.44	266.587	2.48	-0.67	-6.92
4973.00	18.400	250.760	4853.80	386.71	-59.35	-874.03	1763234.92	14620993.48	40°15'28.847"N	80°33'35.217"W	876.05	266.115	2.11	-1.55	-4.39
5068.00	15.630	254.530	4944.64	392.76	-67.71	-900.53	1763208.44	14620985.13	40°15'28.766"N	80°33'35.559"W	903.07	265.700	3.14	-2.92	3.97
5161.00	15.620	260.040	5034.20	400.23	-73.22	-924.94	1763184.04	14620979.62	40°15'28.713"N	80°33'35.875"W	927.83	265.474	1.60	-0.01	5.92
5254.00	15.500	258.860	5123.80	408.57	-77.78	-949.46	1763159.52	14620975.06	40°15'28.669"N	80°33'36.191"W	952.64	265.317	0.36	-0.13	-1.27
5347.00	16.130	260.690	5213.28	417.18	-82.27	-974.40	1763134.59	14620970.57	40°15'28.626"N	80°33'36.513"W	977.87	265.174	0.86	0.68	1.97
5420.00	16.540	262.130	5283.33	424.71	-85.34	-994.70	1763114.30	14620967.51	40°15'28.596"N	80°33'36.775"W	998.36	265.097	0.79	0.56	1.97



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Actual Wellpath Report

Russell Hervey BRK 1H AWP Proj: 13124'
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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #01
Area	Brooke County, WV	Well	Russell Hervey BRK 1H
Field	Brooke	Wellbore	Russell Hervey BRK 1H AWP
Facility	Russell Hervey BRK Pad		

WELLPATH DATA (155 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
5466.00	17.340	270.500	5327.34	430.67	-86.17	-1008.04	1763100.96	14620966.67	40°15'28.589"N	80°33'36.947"W	1011.72	265.114	5.57	1.74	18.20
5512.00	19.850	281.710	5370.95	439.37	-84.53	-1022.55	1763086.46	14620968.31	40°15'28.606"N	80°33'37.134"W	1026.04	265.274	9.47	5.46	24.37
5559.00	22.710	290.240	5414.75	451.67	-79.77	-1038.89	1763070.13	14620973.07	40°15'28.654"N	80°33'37.345"W	1041.94	265.609	8.95	6.09	18.15
5605.00	25.900	297.640	5456.68	467.01	-72.03	-1056.13	1763052.90	14620980.81	40°15'28.731"N	80°33'37.567"W	1058.58	266.098	9.58	6.93	16.09
5651.00	28.480	303.130	5497.60	485.30	-61.37	-1074.22	1763034.82	14620991.46	40°15'28.837"N	80°33'37.799"W	1075.97	266.730	7.82	5.61	11.93
5698.00	31.430	308.490	5538.32	506.72	-47.62	-1093.20	1763015.84	14621005.21	40°15'28.974"N	80°33'38.043"W	1094.24	267.506	8.47	6.28	11.40
5744.00	34.200	311.600	5576.98	530.16	-31.56	-1112.26	1762996.79	14621021.26	40°15'29.133"N	80°33'38.288"W	1112.71	268.374	7.05	6.02	6.76
5791.00	37.710	313.430	5615.02	556.49	-12.91	-1132.58	1762976.47	14621039.91	40°15'29.319"N	80°33'38.549"W	1132.66	269.347	7.81	7.47	3.89
5837.00	41.270	314.870	5650.52	584.64	7.48	-1153.56	1762955.50	14621060.28	40°15'29.521"N	80°33'38.818"W	1153.58	270.371	7.99	7.74	3.13
5883.00	45.300	317.490	5684.00	615.27	30.24	-1175.37	1762933.70	14621083.04	40°15'29.747"N	80°33'39.098"W	1175.76	271.474	9.59	8.76	5.70
5930.00	47.590	318.840	5716.38	648.62	55.62	-1198.08	1762911.00	14621108.41	40°15'29.999"N	80°33'39.389"W	1199.37	272.658	5.30	4.87	2.87
5976.00	50.960	320.340	5746.39	682.91	82.17	-1220.66	1762888.42	14621134.95	40°15'30.263"N	80°33'39.679"W	1223.43	273.851	7.73	7.33	3.26
6022.00	55.750	321.910	5773.84	719.37	110.90	-1243.81	1762865.29	14621163.67	40°15'30.548"N	80°33'39.976"W	1248.74	275.095	10.77	10.41	3.41
6069.00	60.850	324.380	5798.53	759.07	142.90	-1267.76	1762841.34	14621195.65	40°15'30.865"N	80°33'40.283"W	1275.79	276.431	11.73	10.85	5.26
6115.00	65.650	327.300	5819.23	800.02	176.89	-1290.80	1762818.32	14621229.63	40°15'31.202"N	80°33'40.578"W	1302.86	277.803	11.87	10.43	6.35
6161.00	70.640	330.120	5836.35	842.69	213.36	-1312.95	1762796.18	14621266.09	40°15'31.564"N	80°33'40.861"W	1330.17	279.230	12.25	10.85	6.13
6208.00	74.110	332.990	5850.58	887.45	252.74	-1334.27	1762774.86	14621305.46	40°15'31.954"N	80°33'41.133"W	1358.00	280.726	9.40	7.38	6.11
6254.00	77.190	335.550	5861.99	931.88	292.88	-1353.61	1762755.53	14621345.58	40°15'32.351"N	80°33'41.380"W	1384.93	282.209	8.60	6.70	5.57
6300.00	81.230	337.090	5870.60	976.77	334.26	-1371.75	1762737.40	14621386.94	40°15'32.761"N	80°33'41.612"W	1411.88	283.695	9.38	8.78	3.35
6346.00	85.160	338.390	5876.05	1022.01	376.52	-1389.04	1762720.11	14621429.19	40°15'33.180"N	80°33'41.832"W	1439.17	285.166	8.99	8.54	2.83
6393.00	88.860	339.480	5878.50	1068.36	420.31	-1405.91	1762703.25	14621472.96	40°15'33.613"N	80°33'42.047"W	1467.39	286.645	8.21	7.87	2.32
6486.00	90.310	337.460	5879.17	1160.32	506.81	-1440.04	1762669.14	14621559.43	40°15'34.470"N	80°33'42.481"W	1526.62	289.389	2.67	1.56	-2.17
6578.00	90.620	337.500	5878.42	1251.52	591.80	-1475.27	1762633.92	14621644.38	40°15'35.311"N	80°33'42.931"W	1589.54	291.858	0.34	0.34	0.04
6671.00	90.680	337.840	5877.37	1343.66	677.82	-1510.60	1762598.60	14621730.37	40°15'36.163"N	80°33'43.381"W	1655.70	294.166	0.37	0.06	0.37
6764.00	90.620	339.140	5876.31	1435.61	764.33	-1544.70	1762564.51	14621816.85	40°15'37.019"N	80°33'43.815"W	1723.46	296.327	1.40	-0.06	1.40
6857.00	90.740	340.230	5875.21	1527.26	851.54	-1576.98	1762532.24	14621904.02	40°15'37.883"N	80°33'44.226"W	1792.21	298.368	1.18	0.13	1.17
6949.00	90.920	340.340	5873.88	1617.75	938.14	-1608.02	1762501.22	14621990.59	40°15'38.740"N	80°33'44.621"W	1861.67	300.260	0.23	0.20	0.12
7042.00	90.740	338.310	5872.53	1709.48	1025.13	-1640.85	1762468.40	14622077.55	40°15'39.601"N	80°33'45.039"W	1934.76	301.995	2.19	-0.19	-2.18
7135.00	90.400	334.420	5871.61	1801.87	1110.31	-1678.12	1762431.14	14622162.70	40°15'40.445"N	80°33'45.514"W	2012.19	303.490	4.20	-0.37	-4.18
7228.00	90.340	335.120	5871.00	1894.54	1194.44	-1717.76	1762391.52	14622246.79	40°15'41.278"N	80°33'46.020"W	2092.22	304.813	0.76	-0.06	0.75



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WV Department of
Environmental Protection

Actual Wellpath Report

Russell Hervey BRK 1H AWP Proj: 13124'
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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #01
Area	Brooke County, WV	Well	Russell Hervey BRK 1H
Field	Brooke	Wellbore	Russell Hervey BRK 1H AWP
Facility	Russell Hervey BRK Pad		

WELLPATH DATA (155 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
7321.00	90.340	336.260	5870.45	1987.06	1279.19	-1756.05	1762353.25	14622331.51	40°15'42.117"N	80°33'46.508"W	2172.56	306.071	1.23	0.00	1.23
7413.00	90.180	337.890	5870.04	2078.34	1363.92	-1791.88	1762317.43	14622416.20	40°15'42.956"N	80°33'46.965"W	2251.91	307.277	1.78	-0.17	1.77
7506.00	90.490	338.780	5869.49	2170.34	1450.35	-1826.21	1762283.11	14622502.60	40°15'43.812"N	80°33'47.403"W	2332.07	308.456	1.01	0.33	0.96
7599.00	90.580	338.450	5868.62	2262.27	1536.94	-1860.12	1762249.21	14622589.16	40°15'44.670"N	80°33'47.835"W	2412.93	309.565	0.37	0.10	-0.35
7692.00	90.490	335.830	5867.75	2354.52	1622.62	-1896.25	1762213.10	14622674.81	40°15'45.518"N	80°33'48.295"W	2495.73	310.554	2.82	-0.10	-2.82
7784.00	90.550	334.640	5866.92	2446.11	1706.16	-1934.78	1762174.58	14622758.31	40°15'46.345"N	80°33'48.787"W	2579.61	311.407	1.30	0.07	-1.29
7877.00	90.800	336.450	5865.82	2538.66	1790.81	-1973.28	1762136.10	14622842.93	40°15'47.184"N	80°33'49.278"W	2664.74	312.225	1.96	0.27	1.95
7970.00	90.520	342.330	5864.75	2630.34	1877.81	-2006.00	1762103.39	14622929.90	40°15'48.045"N	80°33'49.695"W	2747.76	313.110	6.33	-0.30	6.32
8063.00	90.520	346.220	5863.91	2720.42	1967.31	-2031.20	1762078.20	14623019.36	40°15'48.931"N	80°33'50.014"W	2827.73	314.085	4.18	0.00	4.18
8156.00	91.050	345.810	5862.63	2809.76	2057.54	-2053.67	1762055.74	14623109.56	40°15'49.823"N	80°33'50.298"W	2907.07	315.054	0.72	0.57	-0.44
8249.00	91.230	344.310	5860.78	2899.52	2147.38	-2077.64	1762031.78	14623199.36	40°15'50.712"N	80°33'50.602"W	2987.95	315.946	1.62	0.19	-1.61
8340.00	90.980	339.490	5859.03	2988.49	2233.83	-2105.90	1762003.53	14623285.78	40°15'51.568"N	80°33'50.961"W	3069.99	316.689	5.30	-0.27	-5.30
8430.00	90.800	338.590	5857.63	3077.34	2317.87	-2138.09	1761971.35	14623369.79	40°15'52.400"N	80°33'51.371"W	3153.40	317.310	1.02	-0.20	-1.00
8522.00	90.890	339.030	5856.27	3168.23	2403.64	-2171.34	1761938.11	14623455.52	40°15'53.249"N	80°33'51.794"W	3239.17	317.907	0.49	0.10	0.48
8615.00	90.890	339.330	5854.83	3260.00	2490.55	-2204.39	1761905.07	14623542.41	40°15'54.110"N	80°33'52.215"W	3325.99	318.488	0.32	0.00	0.32
8708.00	90.890	341.350	5853.38	3351.45	2578.12	-2235.68	1761873.80	14623629.94	40°15'54.976"N	80°33'52.613"W	3412.47	319.069	2.17	0.00	2.17
8801.00	90.980	340.200	5851.87	3442.78	2665.92	-2266.29	1761843.20	14623717.70	40°15'55.846"N	80°33'53.002"W	3499.03	319.632	1.24	0.10	-1.24
8893.00	90.740	334.650	5850.48	3533.94	2750.83	-2301.59	1761807.91	14623802.58	40°15'56.686"N	80°33'53.452"W	3586.70	320.081	6.04	-0.26	-6.03
8986.00	90.830	333.190	5849.21	3626.70	2834.35	-2342.48	1761767.05	14623886.07	40°15'57.514"N	80°33'53.974"W	3677.05	320.428	1.57	0.10	-1.57
9079.00	90.710	332.090	5847.96	3719.59	2916.93	-2385.21	1761724.33	14623968.62	40°15'58.332"N	80°33'54.520"W	3767.99	320.727	1.19	-0.13	-1.18
9171.00	90.770	332.380	5846.77	3811.51	2998.34	-2428.07	1761681.49	14624049.99	40°15'59.138"N	80°33'55.068"W	3858.18	320.999	0.32	0.07	0.32
9264.00	91.110	337.020	5845.24	3904.15	3082.38	-2467.79	1761641.77	14624134.01	40°15'59.971"N	80°33'55.575"W	3948.55	321.319	5.00	0.37	4.99
9357.00	91.080	340.570	5843.47	3996.00	3169.05	-2501.42	1761608.16	14624220.65	40°16'00.829"N	80°33'56.003"W	4037.33	321.715	3.82	-0.03	3.82
9450.00	91.450	340.570	5841.41	4087.38	3256.74	-2532.35	1761577.24	14624308.29	40°16'01.697"N	80°33'56.397"W	4125.42	322.132	0.40	0.40	0.00
9543.00	91.140	337.740	5839.31	4179.14	3343.62	-2565.43	1761544.17	14624395.14	40°16'02.557"N	80°33'56.818"W	4214.41	322.502	3.06	-0.33	-3.04
9635.00	91.200	337.030	5837.43	4270.34	3428.53	-2600.80	1761508.82	14624480.02	40°16'03.398"N	80°33'57.269"W	4303.37	322.817	0.77	0.07	-0.77
9728.00	91.080	339.400	5835.58	4362.34	3514.86	-2635.31	1761474.33	14624566.32	40°16'04.252"N	80°33'57.709"W	4393.07	323.139	2.55	-0.13	2.55
9821.00	90.490	338.790	5834.31	4454.14	3601.73	-2668.49	1761441.16	14624653.15	40°16'05.113"N	80°33'58.131"W	4482.55	323.466	0.91	-0.63	-0.66
9914.00	90.340	336.540	5833.63	4546.28	3687.74	-2703.83	1761405.83	14624739.14	40°16'05.964"N	80°33'58.582"W	4572.76	323.751	2.42	-0.16	-2.42
10006.00	90.370	336.700	5833.06	4637.65	3772.19	-2740.33	1761369.34	14624823.55	40°16'06.800"N	80°33'59.047"W	4662.49	324.003	0.18	0.03	0.17

Actual Wellpath Report

Russell Hervey BRK 1H AWP Proj: 13124'
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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #01
Area	Brooke County, WV	Well	Russell Hervey BRK 1H
Field	Brooke	Wellbore	Russell Hervey BRK 1H AWB
Facility	Russell Hervey BRK Pad		

WELLPATH DATA (155 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
10099.00	90.220	338.280	5832.59	4729.84	3858.10	-2775.94	1761333.75	14624909.43	40°16'07.651"N	80°33'59.501"W	4752.97	324.265	1.71	-0.16	1.70
10192.00	90.120	338.520	5832.31	4821.82	3944.57	-2810.17	1761299.53	14624995.86	40°16'08.507"N	80°33'59.937"W	4843.21	324.533	0.28	-0.11	0.26
10285.00	90.030	336.800	5832.19	4913.97	4030.59	-2845.52	1761264.19	14625081.85	40°16'09.359"N	80°34'00.388"W	4933.82	324.779	1.85	-0.10	-1.85
10377.00	89.940	337.060	5832.21	5005.28	4115.23	-2881.57	1761228.16	14625166.46	40°16'10.197"N	80°34'00.848"W	5023.80	324.999	0.30	-0.10	0.28
10470.00	89.940	337.070	5832.31	5097.56	4200.88	-2917.81	1761191.93	14625252.07	40°16'11.045"N	80°34'01.310"W	5114.78	325.217	0.01	0.00	0.01
10563.00	90.060	338.170	5832.31	5189.72	4286.87	-2953.22	1761156.53	14625338.03	40°16'11.897"N	80°34'01.761"W	5205.65	325.437	1.19	0.13	1.18
10656.00	90.180	341.160	5832.11	5281.37	4374.06	-2985.54	1761124.23	14625425.19	40°16'12.760"N	80°34'02.173"W	5295.83	325.684	3.22	0.13	3.22
10749.00	90.400	344.840	5831.64	5371.94	4462.98	-3012.72	1761097.06	14625514.08	40°16'13.640"N	80°34'02.518"W	5384.67	325.979	3.96	0.24	3.96
10841.00	90.310	343.930	5831.07	5461.02	4551.58	-3037.48	1761072.30	14625602.64	40°16'14.517"N	80°34'02.832"W	5472.04	326.283	0.99	-0.10	-0.99
10934.00	90.400	340.120	5830.50	5551.93	4640.03	-3066.18	1761043.62	14625691.05	40°16'15.392"N	80°34'03.196"W	5561.59	326.543	4.10	0.10	-4.10
11027.00	90.340	341.310	5829.90	5643.28	4727.81	-3096.89	1761012.92	14625778.80	40°16'16.261"N	80°34'03.587"W	5651.80	326.774	1.28	-0.06	1.28
11120.00	90.340	338.340	5829.34	5734.89	4815.09	-3128.96	1760980.86	14625866.05	40°16'17.125"N	80°34'03.995"W	5742.43	326.983	3.19	0.00	-3.19
11212.00	90.650	340.740	5828.55	5825.58	4901.28	-3161.12	1760948.72	14625952.20	40°16'17.978"N	80°34'04.405"W	5832.25	327.180	2.63	0.34	2.61
11305.00	90.680	346.600	5827.47	5915.87	4990.48	-3187.25	1760922.59	14626041.37	40°16'18.861"N	80°34'04.736"W	5921.44	327.435	6.30	0.03	6.30
11398.00	91.050	343.690	5826.06	6005.59	5080.35	-3211.09	1760898.76	14626131.21	40°16'19.750"N	80°34'05.038"W	6010.08	327.705	3.15	0.40	-3.13
11490.00	91.110	338.740	5824.33	6095.76	5167.41	-3240.70	1760869.16	14626218.23	40°16'20.612"N	80°34'05.414"W	6099.53	327.906	5.38	0.07	-5.38
11583.00	90.980	335.770	5822.63	6187.97	5253.15	-3276.65	1760833.23	14626303.94	40°16'21.461"N	80°34'05.873"W	6191.29	328.046	3.20	-0.14	-3.19
11676.00	90.280	334.810	5821.61	6280.56	5337.63	-3315.52	1760794.37	14626388.39	40°16'22.297"N	80°34'06.369"W	6283.55	328.153	1.28	-0.75	-1.03
11768.00	90.120	333.380	5821.29	6372.31	5420.38	-3355.71	1760754.20	14626471.11	40°16'23.117"N	80°34'06.882"W	6375.06	328.239	1.56	-0.17	-1.55
11860.00	90.060	332.420	5821.15	6464.19	5502.28	-3397.62	1760712.30	14626552.97	40°16'23.928"N	80°34'07.418"W	6466.76	328.305	1.05	-0.07	-1.04
11953.00	90.220	329.390	5820.92	6557.16	5583.54	-3442.84	1760667.10	14626634.20	40°16'24.734"N	80°34'07.996"W	6559.65	328.342	3.26	0.17	-3.26
12046.00	90.060	331.670	5820.69	6650.15	5664.50	-3488.59	1760621.37	14626715.13	40°16'25.536"N	80°34'08.581"W	6652.58	328.372	2.46	-0.17	2.45
12139.00	90.120	334.100	5820.54	6743.02	5747.27	-3530.97	1760579.00	14626797.87	40°16'26.356"N	80°34'09.123"W	6745.29	328.435	2.61	0.06	2.61
12232.00	90.120	339.630	5820.35	6835.30	5832.76	-3567.50	1760542.49	14626883.32	40°16'27.202"N	80°34'09.589"W	6837.26	328.549	5.95	0.00	5.95
12325.00	90.150	340.630	5820.13	6926.83	5920.22	-3599.11	1760510.90	14626970.75	40°16'28.068"N	80°34'09.991"W	6928.39	328.703	1.08	0.03	1.08
12417.00	90.220	340.050	5819.83	7017.31	6006.86	-3630.06	1760479.96	14627057.36	40°16'28.926"N	80°34'10.385"W	7018.52	328.855	0.64	0.08	-0.63
12510.00	90.150	340.010	5819.53	7108.86	6094.26	-3661.82	1760448.21	14627144.73	40°16'29.791"N	80°34'10.789"W	7109.78	329.000	0.09	-0.08	-0.04
12603.00	90.030	338.580	5819.39	7200.62	6181.25	-3694.70	1760415.34	14627231.69	40°16'30.652"N	80°34'11.208"W	7201.30	329.132	1.54	-0.13	-1.54
12695.00	90.150	340.630	5819.24	7291.30	6267.48	-3726.76	1760383.29	14627317.88	40°16'31.506"N	80°34'11.616"W	7291.78	329.263	2.23	0.13	2.23
12788.00	90.180	346.340	5818.97	7381.67	6356.61	-3753.19	1760356.88	14627406.97	40°16'32.388"N	80°34'11.952"W	7381.93	329.441	6.14	0.03	6.14



Actual Wellpath Report

Russell Hervey BRK 1H AWP Proj: 13124'
Page 7 of 8



REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #01
Area	Brooke County, WV	Well	Russell Hervey BRK 1H
Field	Brooke	Wellbore	Russell Hervey BRK 1H AWB
Facility	Russell Hervey BRK Pad		

WELLPATH DATA (155 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
12881.00	90.090	345.620	5818.76	7471.04	6446.84	-3775.72	1760334.35	14627497.17	40°16'33.280"N	80°34'12.237"W	7471.13	329.644	0.78	-0.10	-0.77
12974.00	90.180	344.080	5818.54	7560.90	6536.60	-3800.02	1760310.06	14627586.90	40°16'34.169"N	80°34'12.545"W	7560.91	329.829	1.66	0.10	-1.66
13067.00	90.220	344.830	5818.21	7650.92	6626.20	-3824.94	1760285.15	14627676.46	40°16'35.055"N	80°34'12.860"W	7650.93	330.004	0.81	0.04	0.81
13099.00	90.030	344.950	5818.14	7681.83	6657.09	-3833.29	1760276.81	14627707.34	40°16'35.361"N	80°34'12.966"W	7681.86	330.066	0.70	-0.59	0.37
13124.00	90.030	344.950	5818.13	7705.98	6681.23	-3839.78	1760270.32	14627731.48	40°16'35.600"N	80°34'13.048"W	7706.02	330.114	0.00	0.00	0.00

TARGETS

Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Russell Hervey BRK 1H BHL Rev-2	5806.00	6671.92	-3863.95	1760246.16	14627722.16	40°16'35.509"N	80°34'13.361"W	point
Russell Hervey BRK 1H LP Rev-2	5880.00	433.55	-1411.16	1762698.01	14621486.19	40°15'33.744"N	80°33'42.114"W	point

WELLPATH COMPOSITION - Ref Wellbore: Russell Hervey BRK 1H AWB Ref Wellpath: Russell Hervey BRK 1H AWP Proj: 13124'

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
26.00	356.00	OWSG EMS rev2 + HRGM	01 MSS <17-1/2"> (170'-356')	Russell Hervey BRK 1H AWB
356.00	1965.00	BHI NaviTrak (Axial)	02 APS EM <12-1/4"> (356')(518'-1965')	Russell Hervey BRK 1H AWB
1965.00	5347.00	BHI NaviTrak (Axial)	03 APS EM <8-3/4"> (1965')(2096'-5347')	Russell Hervey BRK 1H AWB
5347.00	13099.00	BHI AutoTrak Curve (Short)	04 BHI AT Curve <8-1/2"> (5347')(5420'-13099')	Russell Hervey BRK 1H AWB
13099.00	13124.00	Blind Drilling (std)	Projection to bit	Russell Hervey BRK 1H AWB

REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot #01
Area	Brooke County, WV	Well	Russell Hervey BRK 1H
Field	Brooke	Wellbore	Russell Hervey BRK 1H AWP
Facility	Russell Hervey BRK Pad		

COMMENTS
<p>Wellpath general comments API: 47-009-00178-0000 BHI Job #: 8154316 Rig: SDC 46 Duration: 9/29/2016-10/2/2016 MSS <17-1/2"> (170'-356') APS EM <12-1/4"> (356')(518'-1965') APS EM <8-3/4"> (1965')(2096'-5347') BHI AT Curve <8-1/2"> (5347')(5420'-13099') Projected MD at TD: 13124'</p>

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